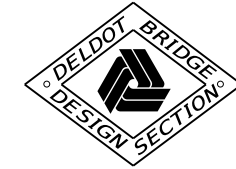
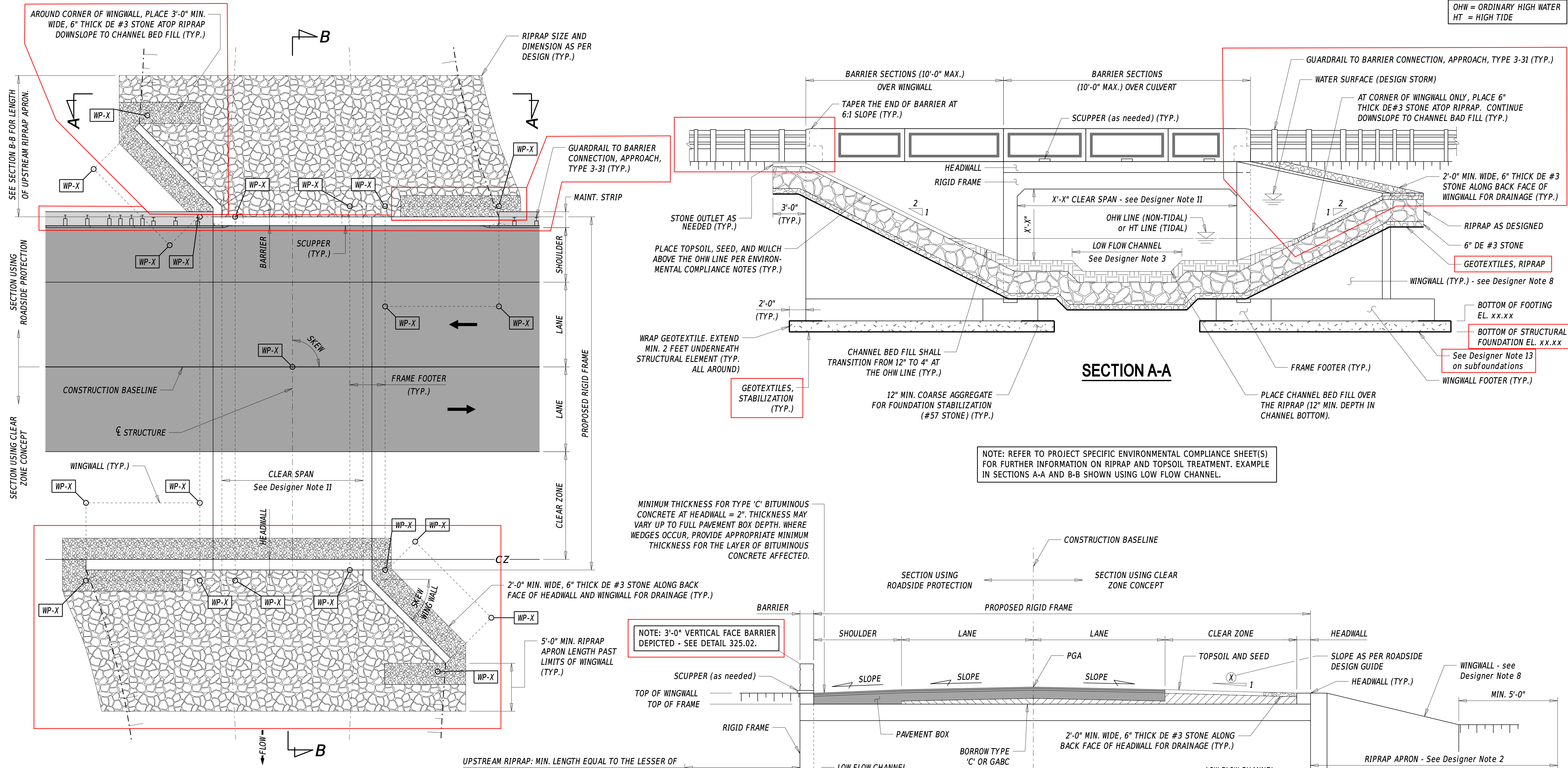
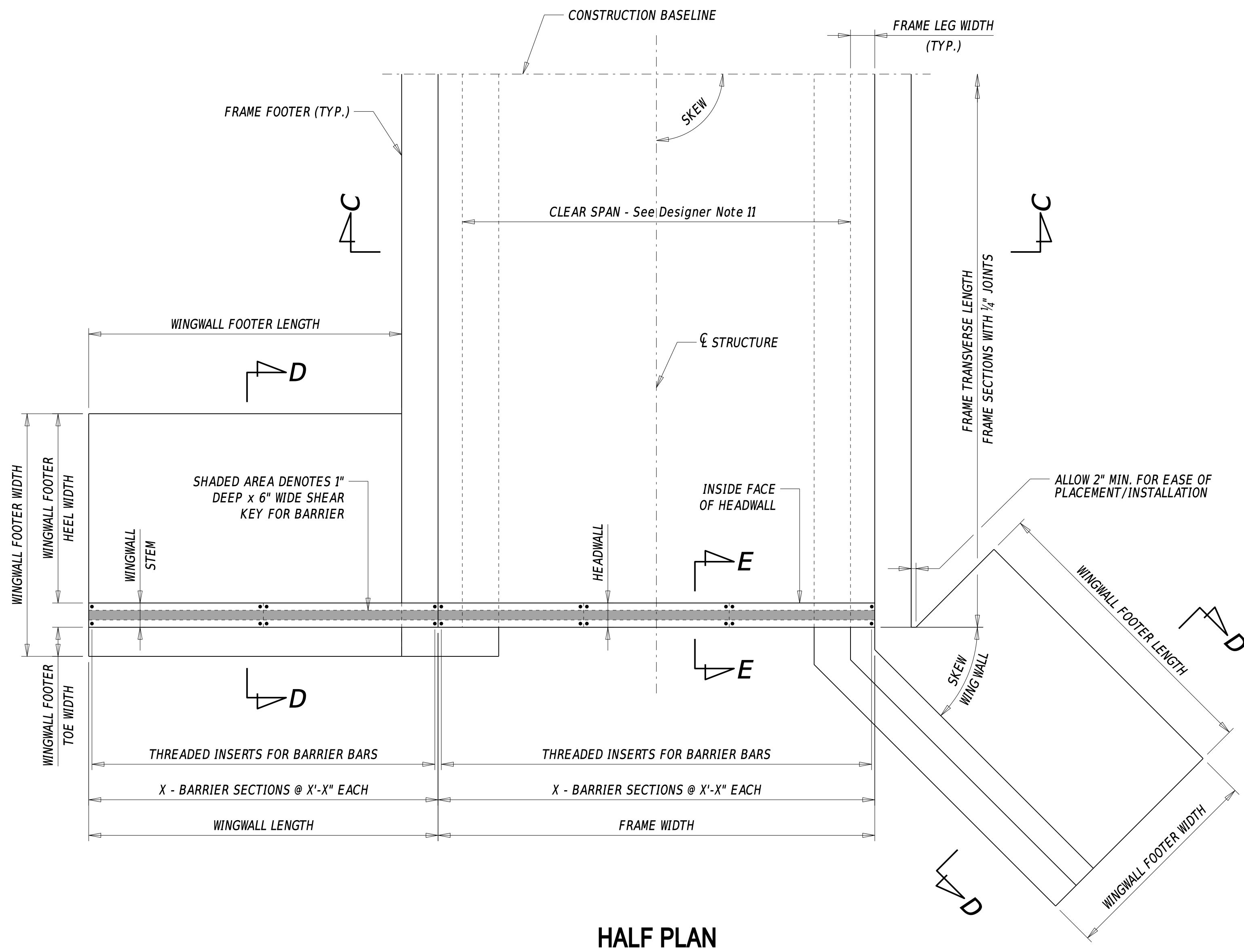


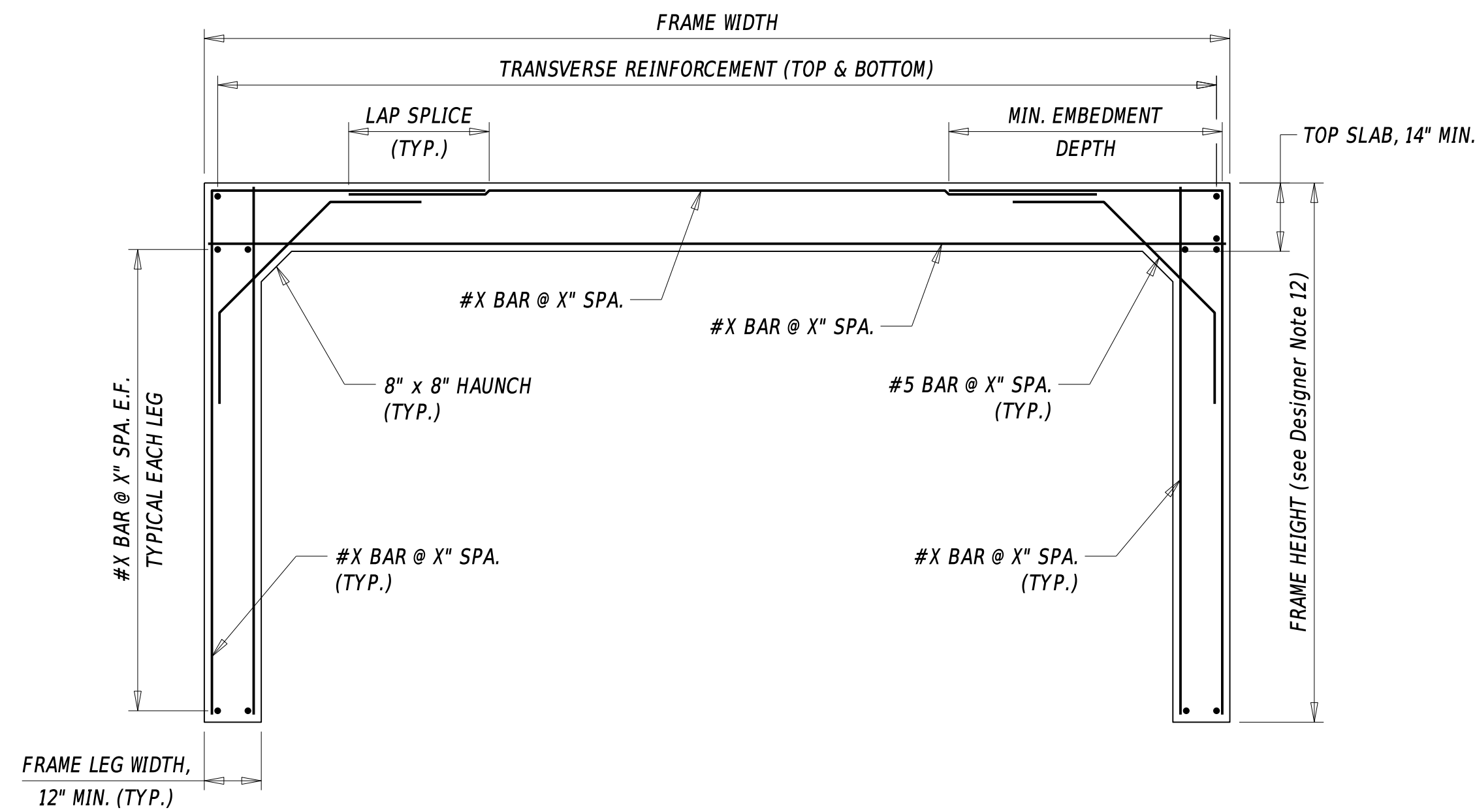
OH-W = ORDINARY HIGH WATER
HT = HIGH TIDE



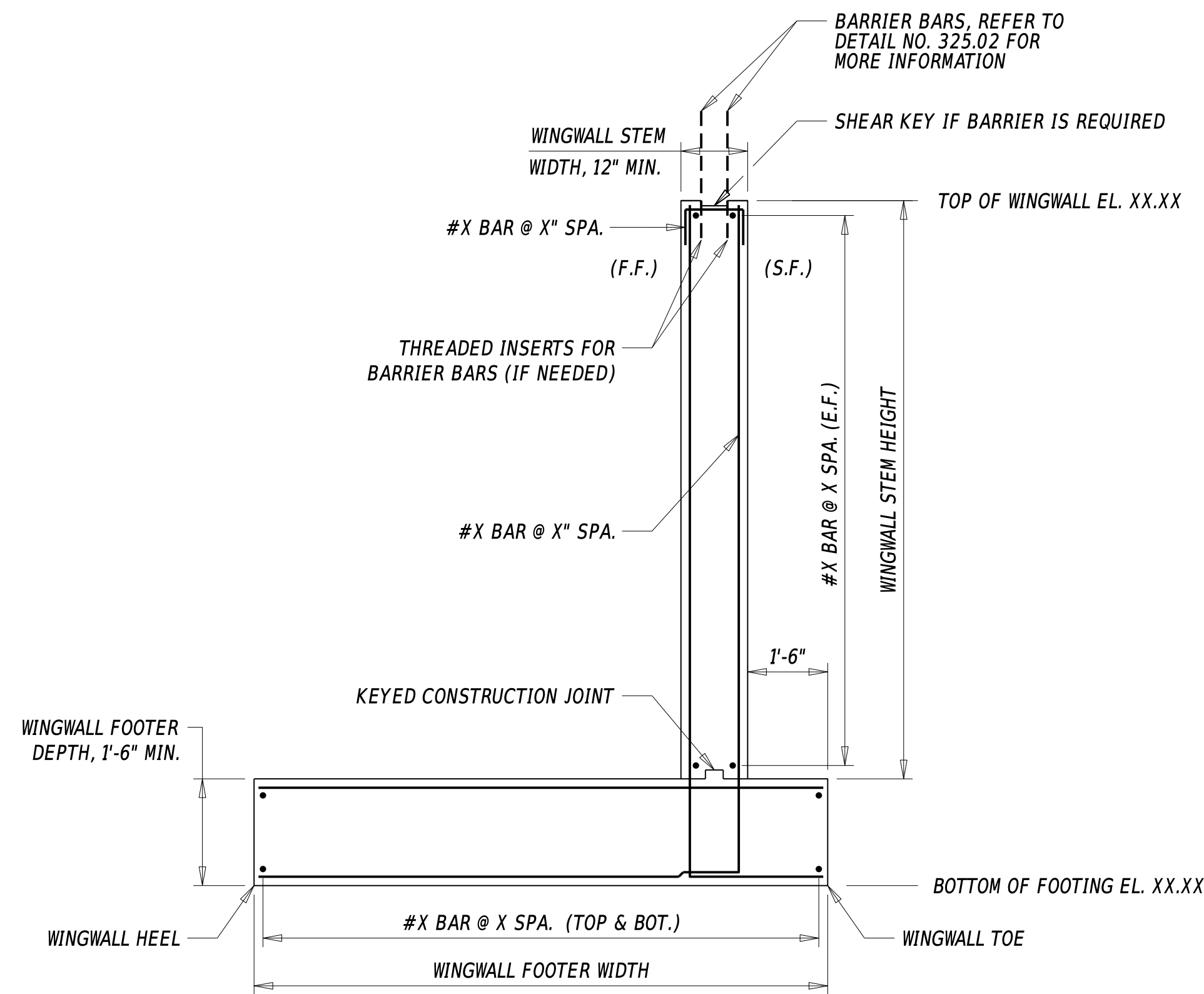


HALF PLAN

NOTE: SECTION WITH ROADSIDE PROTECTION SHOWN. SECTION WITH CLEAR ZONE CONCEPT SIMILAR, BUT OMITTS SHEAR KEY AND INSERTS FOR BARRIER.



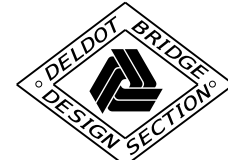
**RIGID FRAME
(SECTION C-C)**

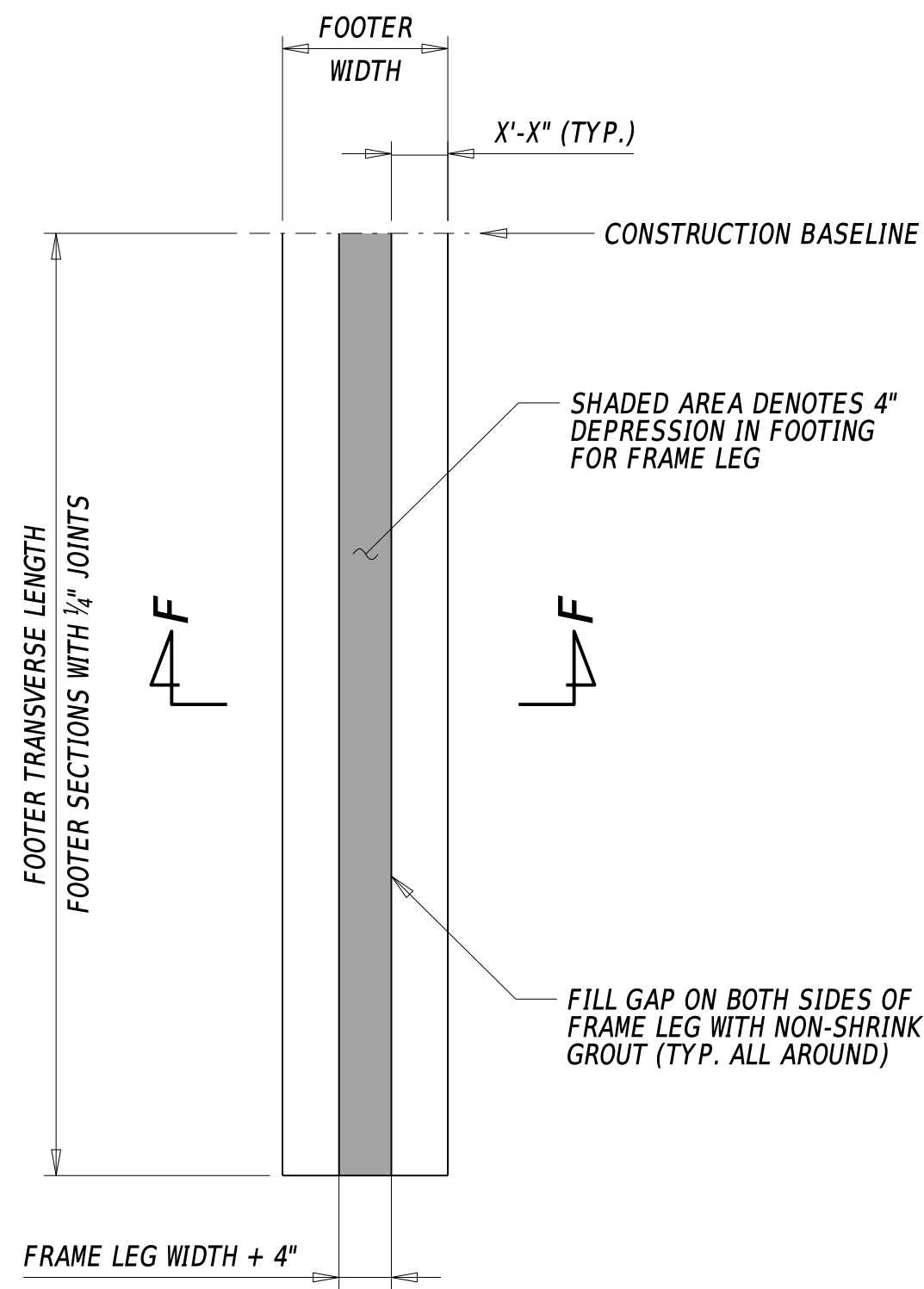


**WINGWALL DETAIL
(SECTION D-D)**

NOTE: FOR WINGWALL USING CLEAR ZONE CONCEPT OR FLARED WINGWALLS, OMIT SHEAR KEY FOR BARRIER.

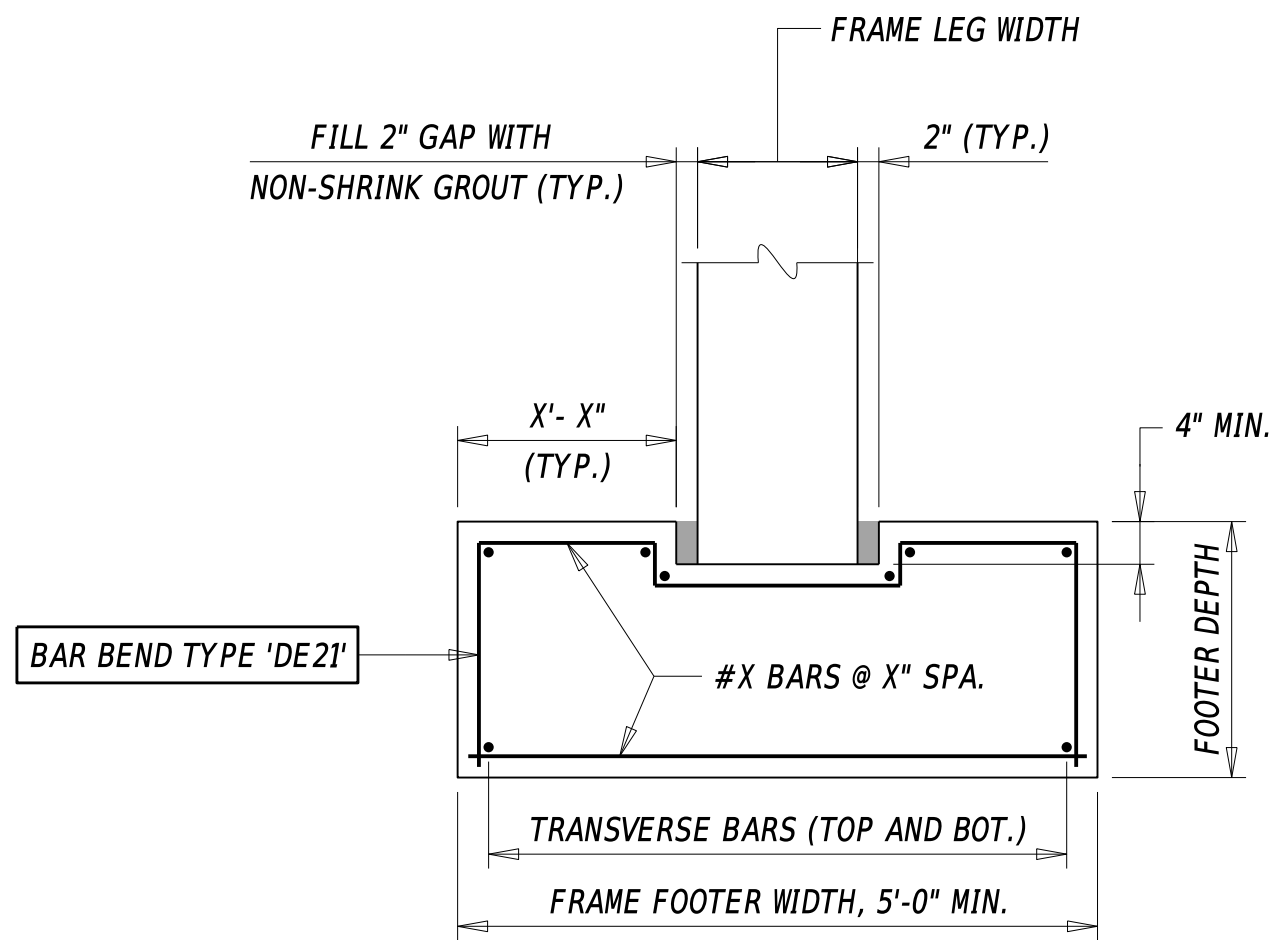
LEGEND
E.F. - DENOTES EACH FACE
F.F. - DENOTES FILL FACE
S.F. - DENOTES STREAM FACE





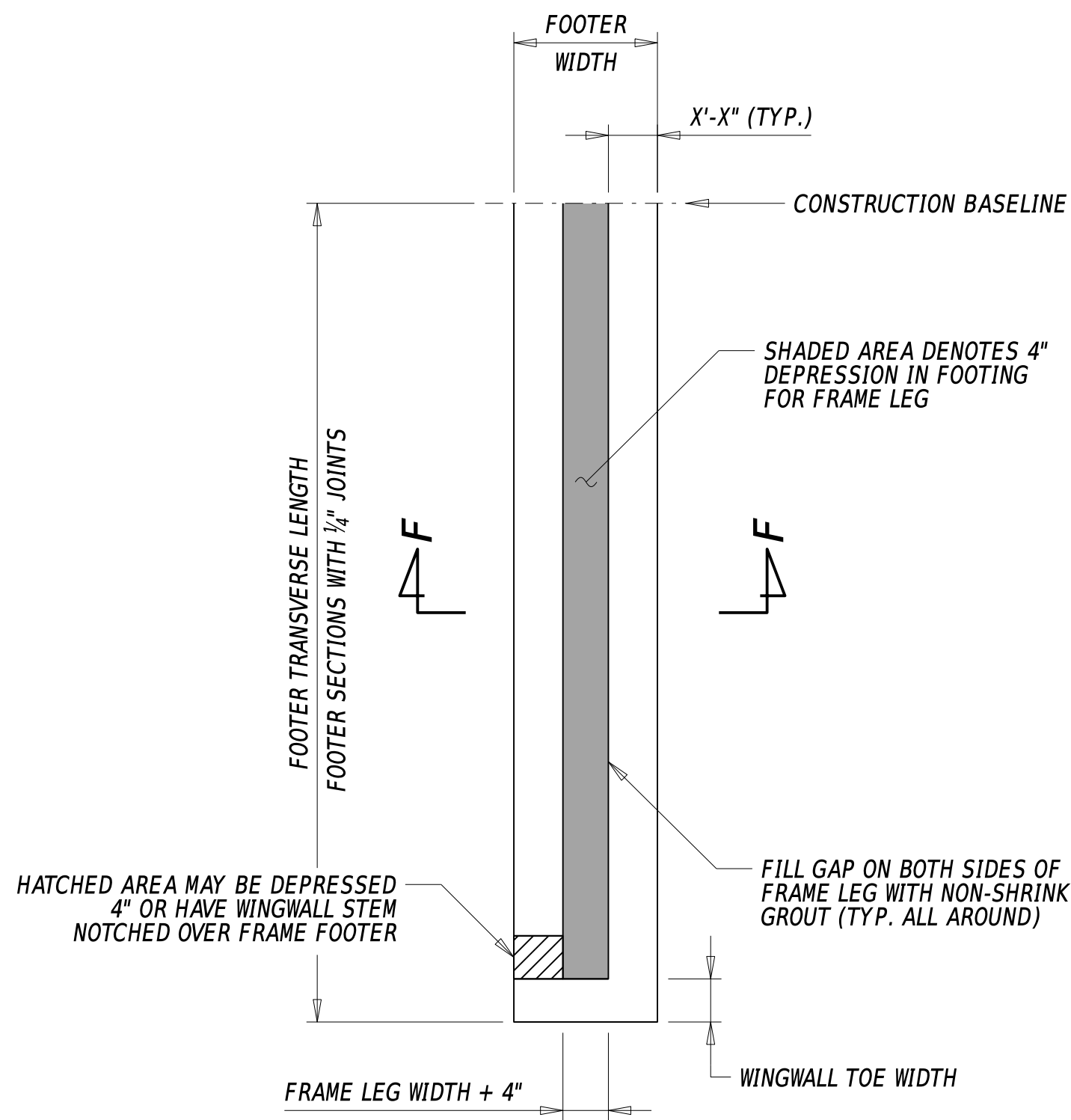
FRAME FOOTER HALF PLAN

(FOR WINGWALLS ATTACHING TO END FACE OF FRAME)



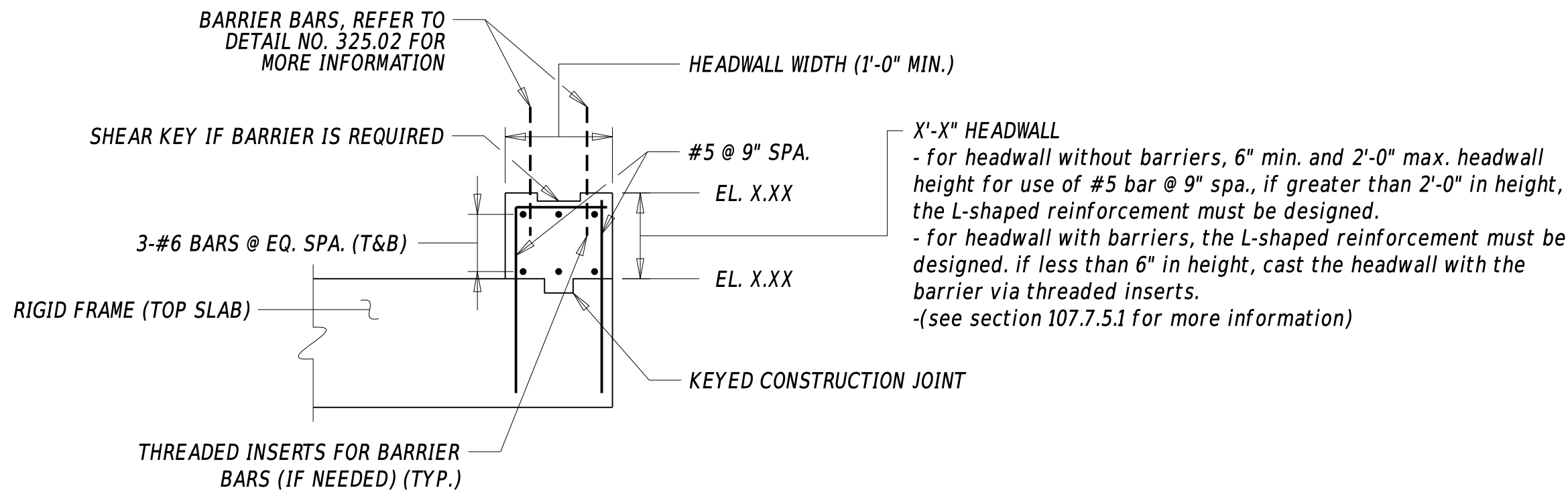
FRAME FOOTER SECTION

(SECTION F-F)



FRAME FOOTER HALF PLAN

(FOR WINGWALLS PARALLEL TO ROADWAY)



HEADWALL DETAIL

(SECTION E-E)

NOTE: FOR WINGWALL USING CLEAR ZONE CONCEPT OR FLARED WINGWALLS, OMIT SHEAR KEY FOR BARRIER.

DESIGNER NOTES

1. THE HYDRAULIC CAPACITY OF RIGID FRAMES SHALL BE DETERMINED IN ACCORDANCE WITH SECTION 104 - HYDROLOGY AND HYDRAULIC INVESTIGATIONS.
2. THE SIZE AND DIMENSION OF RIPRAP PROTECTION SHALL BE AS REQUIRED BY HYDRAULIC CALCULATIONS. FOR UPSTREAM OR DOWNSTREAM LIMITS, THE MINIMUM LENGTH MAY BE EXTENDED TO FIT FIELD CONDITIONS (BENDS, SCOUR HOLES, ETC.). THE MINIMUM SIZE OF RIPRAP IS R-4 IF BURIED AND R-5 IF EXPOSED. RIPRAP SHALL BE CONTOURED TO MATCH THE SHAPE OF THE EXISTING STREAM BANKS AT THE PROJECT LIMITS.
3. AS DIRECTED BY ENVIRONMENTAL STUDIES SECTION, A LOW FLOW CHANNEL SHALL BE CONSTRUCTED IN THE RIPRAP AND CHANNEL BED FILL. DIMENSIONS OF THE LOW FLOW CHANNEL ARE LOCATION SPECIFIC AND WILL BE PROVIDED BY THE ENVIRONMENTAL STUDIES SECTION.
4. EXAMPLES SHOWN ON SHEET 1 UTILIZE SCUPPERS. THE NEED FOR SCUPPERS SHALL BE EVALUATED ON A CASE BY CASE BASIS.
5. 'GUARDRAIL OVER CULVERTS' AS SHOWN IN DELDOT STANDARD CONSTRUCTION DETAILS MAY BE CONSIDERED FOR SHORT SPAN FRAMES (APPROXIMATELY 20' SPAN OR UNDER) IN LIEU OF CONCRETE BARRIERS IF THE WINGWALLS ARE FLARED OR OFFSET AND THE WIDTH OF THE FRAME WILL ACCOMMODATE FOR THE MAIN SPACING OF 'GUARDRAIL OVER CULVERTS'.
6. THE EXAMPLES USED FOR RIGID FRAMES IN THIS DETAIL DOES NOT INCLUDE ANY MENTION OF DEEP FOUNDATIONS. GENERALLY FOR RIGID FRAMES, ONE SHOULD STRIVE TO USE SPREAD FOOTERS. IF DEEP FOUNDATIONS ARE REQUIRED, OTHER ALTERNATIVES MAY HAVE TO BE CONSIDERED SUCH AS SINGLE SPAN BRIDGE SUPPORTED BY STUB ABUTMENTS ON DRIVEN PILES.
7. MORE INFORMATION ON BARRIER DETAILS CAN BE FOUND IN DETAIL NO. 325.02 - BRIDGE RAILING DETAILS.
8. WINGWALL LAYOUT:
THE DESIGNER SHALL CONSIDER THE HEIGHT OF THE ROADWAY EMBANKMENT, THE ELEVATION OF THE SURROUNDING GROUND, AND THE DEPTH OF THE STREAM CHANNEL TO DETERMINE THE WINGWALL LAYOUT.

(a.) AT SITES WHERE THERE IS LITTLE OR NO ROADWAY EMBANKMENT AND A DEEP CHANNEL, WINGWALLS PARALLEL TO THE ROADWAY ARE THE PREFERRED OPTION. PARALLEL WINGWALLS FOR SECTION WITH ROADSIDE PROTECTION CAN UTILIZE BARRIER ALONG THE ENTIRE LENGTH (AS DEPICTED IN THIS DETAIL) OR BE OFFSET BEHIND GUARDRAIL (NOT DEPICTED IN THIS DETAIL) WHERE THE BARRIER IS PLACED ONLY ON THE RIGID FRAME OR GUARDRAIL OVER CULVERTS IS USED.

(b.) AT SITES WHERE THERE IS A RELATIVELY TALL ROADWAY EMBANKMENT AND VERY SHALLOW CHANNEL, WINGWALLS PERPENDICULAR TO THE ROADWAY MAY BE USED.

(c.) FOR CASES IN-BETWEEN (THAT HAVE SOME ROADWAY EMBANKMENT AND SOME CHANNEL DEPTH), ANGLED WINGWALLS ARE PREFERRED. 45° WINGWALLS ARE DEPICTED IN THIS DETAIL, BUT 15°, 30°, AND 60° WINGWALLS MAY BE USED BASED ON SITE CONDITIONS. IN ADDITION, WHERE THE STREAM APPROACHES THE BRIDGE INLET AT AN ACUTE ANGLE OF ATTACK, CONSIDER USING A DIFFERENT WINGWALL ANGLE ON THE OUTSIDE OF THE BEND SO THAT THE WINGWALL CAN ACT AS A GUIDE WALL TO HELP DIRECT FLOW IN TO THE INLET.

(d.) AT FRAMES WITH A HIGH SKEW ANGLE (GREATER THAN 20°), WINGWALLS WITH BARRIER PARALLEL TO THE ROADWAY CAN BE ADVANTAGEOUS FOR GUARDRAIL TO BARRIER CONNECTION, REGARDLESS OF SITE CONDITIONS.
9. THE FORMER PRECAST NOTES (WEEPHOLES, CONNECTION PLATES, ETC.) INCLUDED IN PAST REINFORCED CONCRETE RIGID FRAME PROJECTS ARE NO LONGER REQUIRED TO BE SHOWN ON THE PLANS. THESE NOTES HAVE BEEN ADDED TO SECTION 612 OF THE DELDOT STANDARD SPECIFICATIONS.
10. PLACEMENT OF WEEPHOLES: WHEN POSSIBLE, PLACE WEEPHOLE OUTLETS ABOVE THE OHW LINE. THE DESIGNER SHOULD CONSIDER USING WEEPHOLES WHERE SPRINGS ARE PREVALENT (PIEDMONT REGION) OR WHEN THE BRIDGE IS IN PRONOUNCED SAG/VALLEY. WEEPHOLES ARE GENERALLY NOT NEEDED WHEN THE STRUCTURE IS IN AN EMBANKMENT.
11. THE DESIGNER SHOULD CONSIDER USE OF PRECAST CONCRETE RIGID FRAMES FOR SPANS OF 14'-0" TO 25'-0".
12. THE DESIGNER SHOULD BE AWARE OF TRANSPORTATION ISSUES ASSOCIATED WITH RIGID FRAMES WITH HEIGHTS GREATER THAN 13'-6", WHICH WILL REQUIRE POLICE ESCORT (WIDE LOAD). THIS WILL LIKELY RESULT IN HIGHER BID PRICE. OTHER BRIDGE TYPES SHOULD BE EVALUATED IF THIS IS THE CASE.
13. LIMITS FOR POTENTIAL EXCAVATION OF UNSUITABLE MATERIAL IN SECTION A-A AND B-B VIEWS NOT SHOWN FOR CLARITY. FOR PROJECTS THAT REQUIRE EXCAVATION OF UNSUITABLE MATERIAL, SHOW BOTTOM OF STRUCTURAL FOUNDATION AND SPECIFY TYPE(S) OF BACKFILL TO BE USED ON SECTION A-A AND B-B VIEWS. FOR MORE INFORMATION ON SUBFOUNDATIONS, SEE DETAILS 301.01 AND 301.04.

